F. J. SCHUMANN.

VENDING MACHINE.

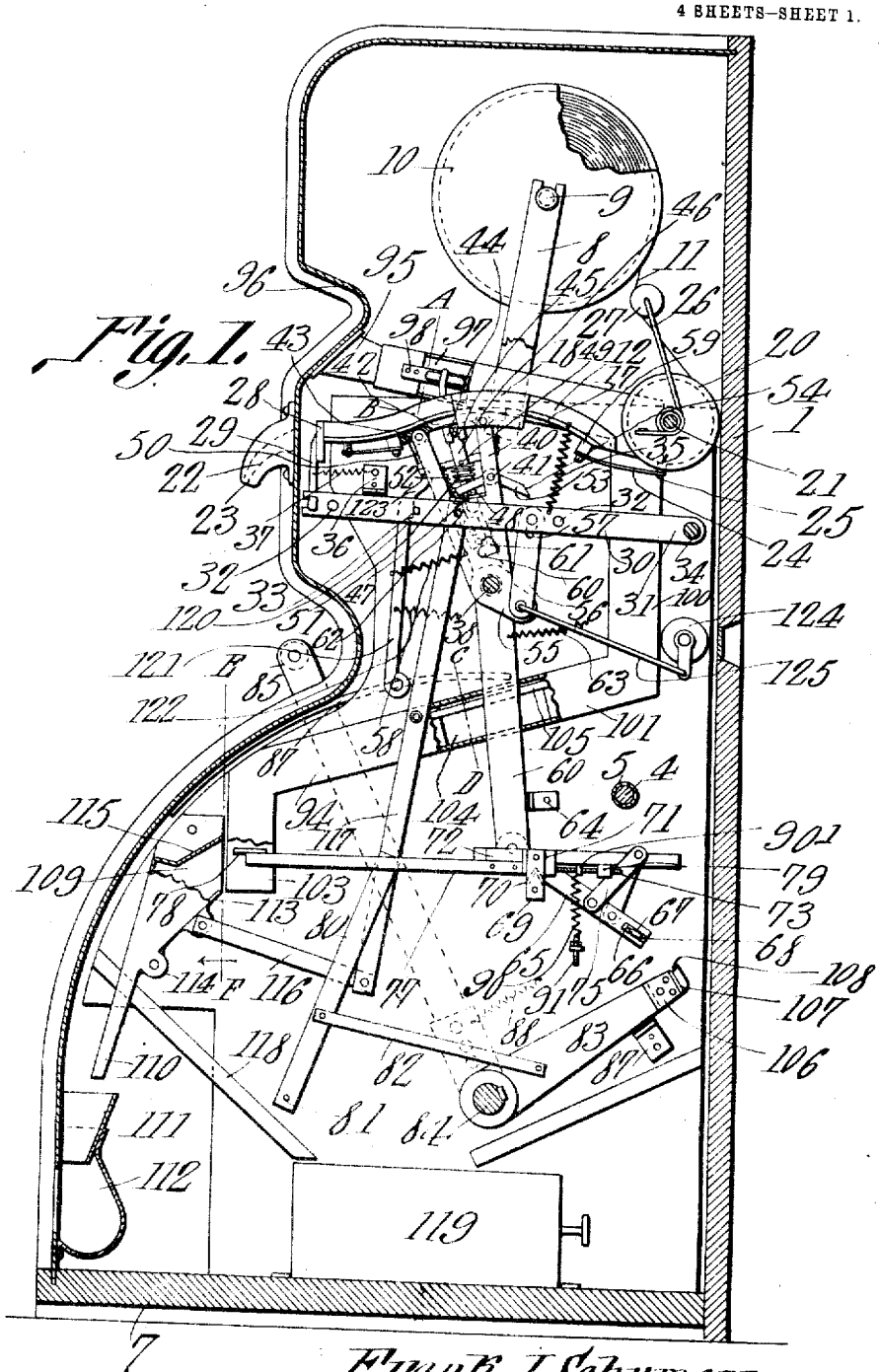
APPLICATION FILED MAY 7, 1910.

1,025,075

Patented Apr. 30, 1912

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses

J. C. Bowen

T. T. Chapman.

Frank J. Schumann, Inventor

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4 SHEETS—SHEET 2.

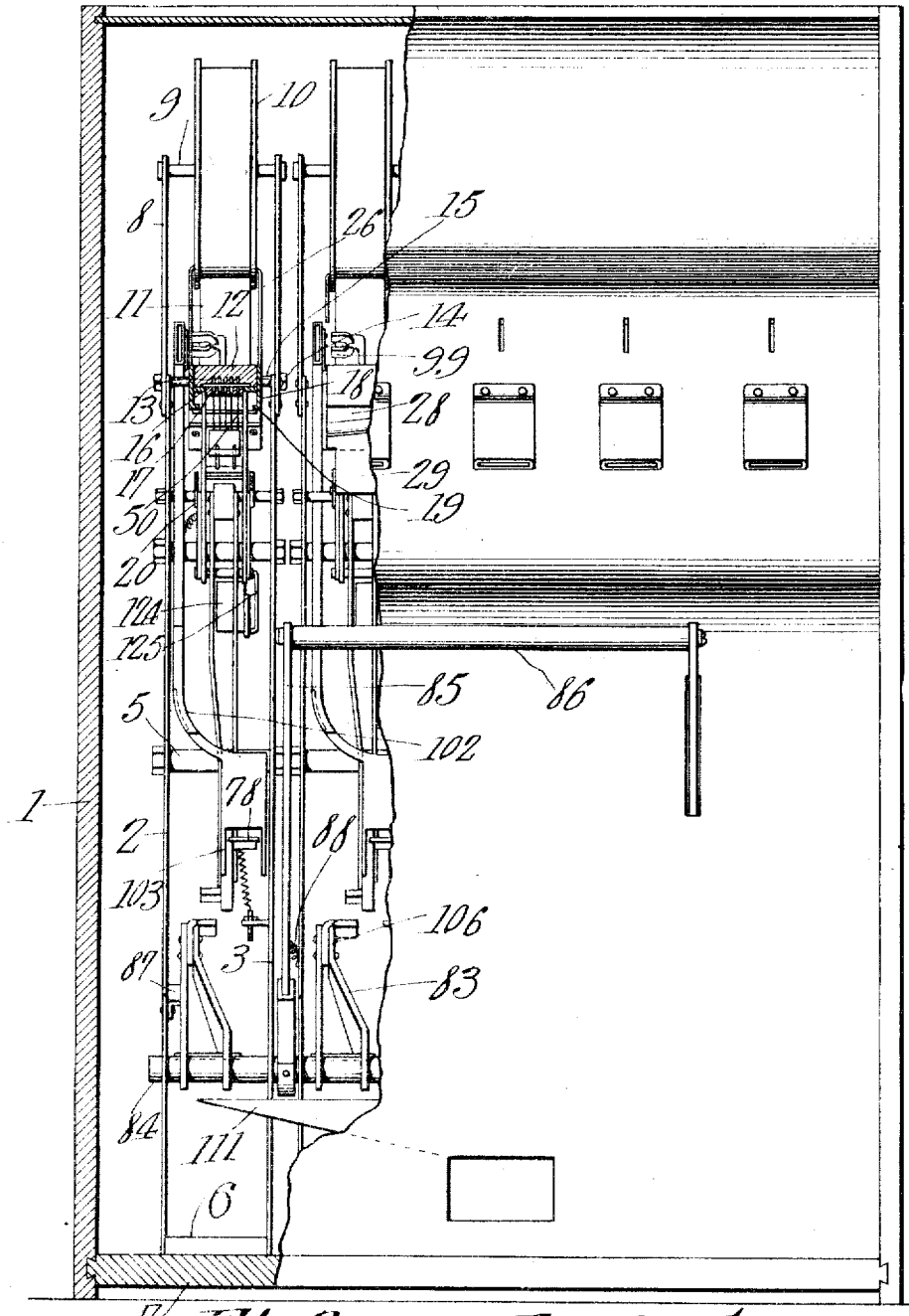

Fig. 2.

Witnesses

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4 SHEETS—SHEET 3.

Fig. 3.

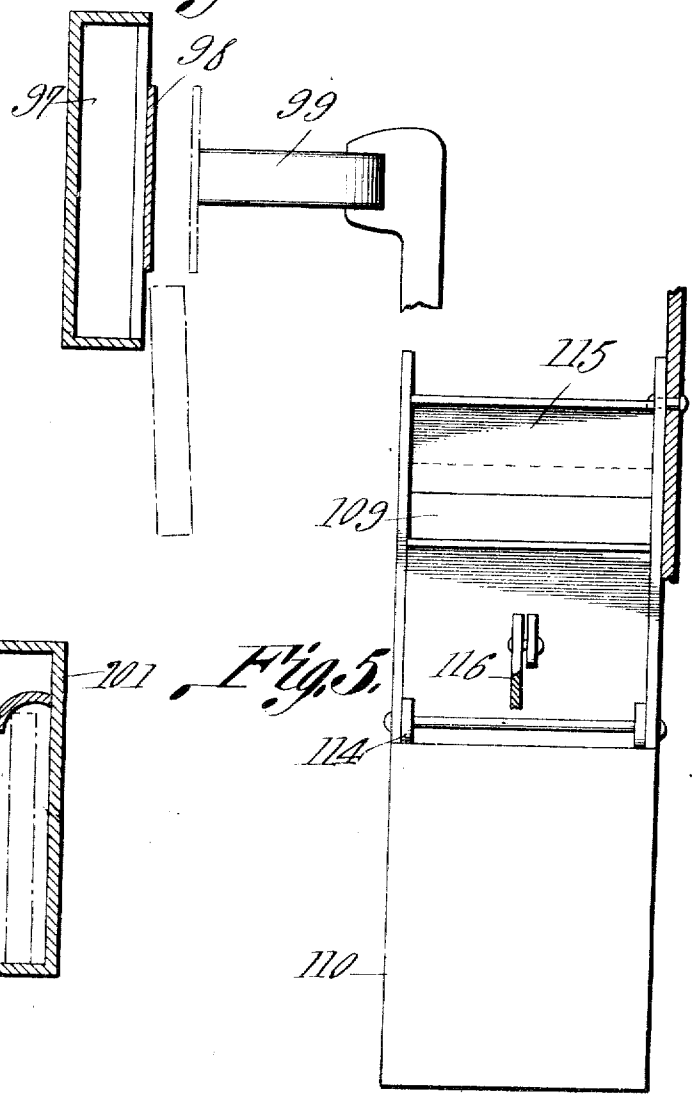

Fig. 5.

Fig. 4.

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4 SHEETS—SHEET 4.

Fig. 6.

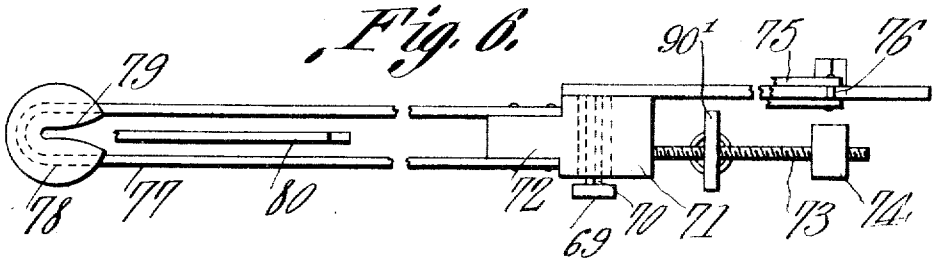
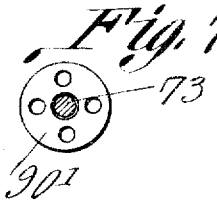


Fig. 7.



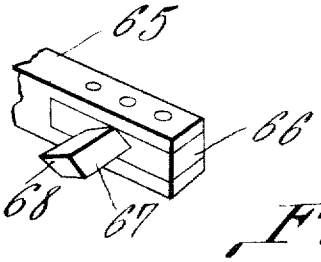
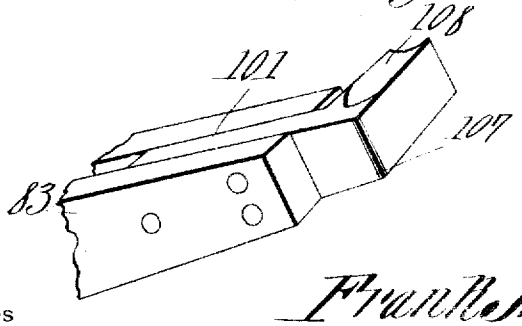


Fig. 8.



Witnesses

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UNITED STATES PATENT OFFICE.

FRANK J. SCHUMANN, OF BETHLEHEM, PENNSYLVANIA.

VENDING-MACHINE.

1,025,075. Specification of Letters Patent. Patented Apr. 30, 1912.

Application filed May 7, 1910. Serial No. 560,055.

To all whom it may concern:

Be it known that I, FRANK J. SCHUMANN, a citizen of the United States, residing at Bethlehem, in the county of Northampton and State of Pennsylvania, have invented a new and useful Vending-Machine, of which the following is a specification.

This invention has reference to improvements in vending machines and is designed more especially for the vending of tickets or postage stamps or like articles and while not necessarily confined thereto the machine is designed to vend or deliver the tickets or stamps from a continuous web of the same in the form of a roll stored within the machine.

The present invention is adapted to either single or multiple machines and comprises a means whereby an inserted coin of proper value and in proper condition will establish predetermined relations between the part of the machine accessible to and actuated by the operator, and the vending side of the machine as to cause the delivery of the stamp or ticket or like article into position to be readily withdrawn by the operator or customer.

The present invention comprises means whereby inappropriate coins or slugs will fail to operate the machine and will be returned to the customer.

The invention will be best understood from a consideration of the following description taken in connection with the accompanying drawings forming a part of this specification, in which drawings:

Figure 1 is a vertical front to rear section through the casing of the machine showing the operating mechanism in most part in elevation. Fig. 2 is a front elevation of the machine with a number of separate vending mechanisms, with parts of the casing broken away and parts of the interior mechanism in section. Fig. 3 is a section on the line A—B of Fig. 1. Fig. 4 is a section on the line C—D of Fig. 1. Fig. 5 is a section on the line E—F of Fig. 1. Fig. 6 is a plan view of the cam actuated lever for controlling the actuating and delivery mechanisms. Fig. 7 is a view showing a detail of the lever of Fig. 6. Fig. 8 is a perspective view showing the engaging portions of the actuating and delivery mechanisms.

Referring to the drawings there is shown a casing 1 of suitable size and shape to house the several mechanisms necessary for the coin lock and vending devices and in the drawings the casing is of sufficient size to house three such mechanisms any one of which may be operated on the introduction of a proper coin.

In the casing each vending apparatus is mounted in a suitable framework made up of spaced side plates 2, 3, connected together by bolts 4 carrying spacing sleeves 5, or any other suitable construction whereby the side plates 2 and 3 are held in spaced relation may be employed. Between the bottoms of the side plates 2 and 3 is a spacing block 6 which may rest on and be secured to the bottom 7 of the main casing of the machine.

On top of the side plates 2 and 3 are posts or standards 8 notched at the upper ends to receive the journals 9 of a drum 10. Wound on the drum 10 is a web 11 of tickets or stamps or like articles to be vended. Secured between the upper ends of the side plates 2 and 3 is a curved guide member 12 having formed in the under face a series of parallel longitudinal grooves 13, this guide plate 12 being held between the side plates by screws 14 and spacing sleeves 15. The opposite long edges of the grooved face 12 are formed with ledges 16 to which are attached strips 17 under-riding the face of the strip 12 on each side of the series of grooves 13, these strips forming edge supports for the web of stamps or tickets as will hereinafter appear. At a point about midway the length of the curved member 12 are side plates 18 projecting for a distance below the lower grooved face of the strip 12 and along the bottom edge provided with inturned flanges 19 for a purpose which will presently appear.

The web 11 is carried from the supply roll around a guide roller 20 journaled on a rod 21 secured at the ends in the side plates 2 and 3 and from this roller the web is carried to the under surface of the curved strip 12 in the passage between said under surface and the strips 17 to be ultimately directed toward a discharge guide block or chute 22 at the front of the casing, this chute having a passage therethrough widened at the receiving end so that the end of the web or as will hereinafter appear of the tickets or stamps will find ready entrance thereinto while the passage 23 is curved downward and made of less size in

the direction of the thickness of the tickets so that at the discharge end the stamp or ticket is frictionally engaged to remain in the discharge chute until withdrawn therefrom by the customer, the frictional engagement being so regulated that the ticket will not fall from the chute but may be readily withdrawn by the customer without sensible effort. The guide member 12 carries near each end elastic arms 24 carrying at their free ends pressure pins 25 serving to hold the web at these points frictionally against movement except under a sufficient force.

Mounted on the rod 21 on each side of the roller 20 is an elastic or spring yoke 26 carrying at its free end a roller 27 adapted to engage the web 11 between the supply drum and the roller 20. The roller 27 serves as a tension roller which, however, will yield to a force tending to draw the web from the main supply drum.

At the discharge end of the guide strip 12 there is provided a shear plate 28 over which there is movable a knife or shear blade 29 pivotally connected to one end of a lever 30 composed of two spaced bars 31 joined by connecting and spacing rods 32, 33, the latter named rod, that is the rod 33 being in part or in whole of rectangular cross section for a purpose which will presently appear. The lever 30 is carried by a pivot rod 34 near the rear edges of the plates 2 and 3, while the front end of this lever is close to the inner wall of the front of the casing. The lever 30 is under the normal control of a spring 35 tending to maintain the lever in the elevated position against a stop member 36 and the knife blade 29 is maintained in engagement with shear blade 28 by a spring 37 carried by the stop member 36.

At a point coincident with the axis of curvature of the under face of the guide strip 12 is a pivot bolt or rod 38 mounted in the side members 2 and 3. Mounted on the rod 38 is a lever made up of two spaced side members 39 of general segmental shape terminating in divergent legs 40 and joined together by bolts or rivets 41. At the outer ends the legs 40 carry a curved plate 42 entering between the guide strips 17 and having the outer surface substantially coincident with the inner faces of these guide strips 17. At each end the plate 42 is provided with a transverse series of perforations 43 for a purpose which will presently appear. The perforations however are separated, one series from the other, by the length of the ticket or stamp or other article to be vended. About midway of the length of the plate 42 and on opposite sides thereof are pairs of guide pins 44 between which are movable the ends of a cross head 45 on the end of a bolt or rod 46, the other end of which traverses a suitable perforation in a guide strip 47 traversing the lever 37 at the crotch of the legs 40. Movement of the rod 46 in one direction is determined by the engagement of the end of the rod with the plate 42 and in the other direction by a cross pin 48 engaging the strip 47. About midway of its length the rod 46 carries another cross head 49 disposed at right angles to the cross head 45 and extending in the direction of the length of the plate 42. At the ends the cross head 49 carries series of pins 50 adapted to the series of perforations 43 in the plate 42 and these pins and perforations also coincide with the longitudinal grooves or recesses 13 in the guide plate 12.

The rod 46 is maintained in one position by a spring 51 attached to the lever 39 and to the cross head 49 respectively. Surrounding the rod 46 adjacent to the cross head 49 is a spring 52. Mounted on the lever 39 on one of the rivets or bolts 41 between two of the legs 40 is an angle lever 53 having one end straddling the rod 46 in position to engage the spring 52 while the other end is beveled as indicated at 54 so that under circumstances to be presently described this end will engage one of the bolts or rivets 32 of the lever 30. The lever 39 has a short arm 55 connected by a link 56 to the lever 30 and this link 56 has an elongated slot 57 where connected to the lever 30 so that there may be relative movement between the link and lever when necessary.

The lever 39 is normally maintained at one limit of its movement by a spring 58 connected to the lever and to the side plate 2 or 3. The limits of movement of the lever 39 are determined by stops 59 on the guide plate 12 which stops may serve as supports for the spring members 24 before referred to. Mounted on the pivot bolt or rod 38 is a lever 60 having a short arm 61 extending between the side members of the lever 39 and terminating in a cam end 62 in the path of which is normally located the lower end of the rod 46. The lever 60 is maintained in one position by a spring 63 and this position is determined by a stop member 64 in the path of the long arm of the lever.

Pivoted to the extremity of the long arm of the lever 60 is a bar 65 carrying at its free end a block 66 having a lateral extension 67 provided with oppositely disposed bevel edges 68 which may form substantially knife edges. Fast to one of the side plates 2 or 3 of the supporting frame is a block 69 carrying a knife edge 70 adapted to a suitable notch in a block 71 carried by a lever 72 near one end of the latter. This lever 72 also carries a threaded rod 73 on which may be mounted a counterweight 74. The bar 65 is supported from the rod 72 by spaced strap members 75 connected at the upper ends by a pin 76 in overriding relation to

the upper edge of the lever 72 so that the bar 65 is not only supported by the lever 72 but will participate in movements of the latter.

The end of the lever 72 remote from that carrying the bar 65 is provided with an extension 77 formed of two spaced members or a single strip bent on itself and united in spaced relation to the lever 72. The outer end of the strip 77 carries a plate 78 provided on the end toward the strip 77 with a recess 79 having approaching walls. Lodged within the extension 77 between the two side members thereof is the free end of a lever 80 pivoted at the other end to one of the side plates, say the side plate 2, by a pivot pin 81. The lever 80 is connected at an intermediate point to a link 82 which in turn is connected to a rock arm 83 on a rock shaft 84 which is journaled in the side plates 2 and 3 in the several compartments where more than one vending apparatus is lodged within the casing, this shaft 84 being common to all the vending devices. Fast to the shaft 84 are spaced arms 85 extending to the exterior of the casing through suitable slots formed therein and outside the casing joined by the handle bar 86 within easy reach of the customer.

In practice the slots through which the arms 85 extend are closed against access by suitable guard plates 87 carried by the arms 85 and any of the usual full stroke insuring devices may be employed, but since the structure of such devices forms no part of the present invention no showing thereof is made in the drawings. The arms 85 are maintained in the normal position by a spring or springs 88 coacting with a stop member 89 for each rock arm 83. Since the lever 72 with its extension 77 is designed to respond to the weight of a deposited coin, the extension 77 is maintained normally in the elevated position by a spring 90 fast at one end to the lever 72 by a nut 90′ on the screw 73, which nut has a series of holes near its edge to receive the end of the spring so that its relation to the fulcrum of the lever may be adjusted. The other end of the spring is fast to an adjusting screw 91 extending through a bracket 92 on the plate 2 and locked in position by a lock nut 93. The adjustable spring 90 and the adjustable counterweight 74 constitute a very delicate means for adjusting the lever 72.

Each vending apparatus is provided with a coin conduit or chute 94 having a mouth end 95 for the reception of the appropriate coin and this mouth end may be located at an inset portion 96 of the casing, this inset portion having the face carrying the mouth end of the conduit inclined to the vertical so as to facilitate the introduction of the coin into the coin chute. The first portion of the coin chute is provided on one side with a side opening 97 normally closed against escape of coins by a light leaf spring 98 having near the end a magnet 99 so that should an iron or steel disk or like object be introduced into the coin chute the attractive force of the magnet will be sufficient to draw the iron disk toward it against the action of the spring and the movement is sufficient to permit the disk to escape through the opening 97 and so fall into a suitable conduit returning such disk to the exterior of the machine. Since such a return conduit is common in machines of this character the showing thereof has been omitted from the drawing. While the spring 98 is a delicate spring it will readily retain a coin of non-magnetic or weak magnetic qualities in the conduit or chute and thus prevent its escape through the side opening 97. That portion of the chute containing the side opening 97 is downwardly inclined so that the coin acquires a certain momentum and the end of this inclined portion leads into a substantially vertically disposed portion 100 down which the coin may gravitate rapidly and this vertical portion leads into another inclined portion 101 which at the lower end close to the front of the casing is turned laterally as indicated at 102 and terminates in a divergent part 103 into which the extension 77 of the lever 72 enters, this divergent portion containing the plate 78 in position to receive a coin flatwise. The portion 101 of the conduit may also have a lateral curve and this curved portion may be provided with an opening 104 along the top of which is located a spring 105 having its free end slightly curved so as to maintain a coin of proper diameter in the chute but permit a coin of smaller diameter to readily escape when this laterally curved portion of the chute is reached. Therefore coins which reach the plate 78 are of non-magnetic character or substantially so and are of proper diameter. But there still remains worn coins and slugs or coins of too heavy a character to properly operate the machine and this is taken care of by the lever 72 when the coins fall on the plate 78. If the coins be too light then the lever 72 maintains its normal position. If the coins be too heavy then the lever is rocked a commensurate distance. If the coins be of the proper weight the lever stops at the proper intermediate distance.

At the end of the arm 83 there is secured a block 106 having one edge 107 beveled or inclined and the other edge 108 shaped to engage the beveled or knife edge 68 of the block 66 when this block or its extension 67 is in the path of the block 106. Under the normal condition of the parts, that is when no coin is present the extension 67 of the block 66 is sufficiently depressed to be out of the path of the block 106. When a coin of

too heavy a character is on the plate 78 then the block extension 67 is elevated to too great an extent to be engaged by the block 106 when the arm 83 is rocked. It is only when a coin of proper weight is lodged on the plate 78 that the lever is moved to a position causing the locating of the block extension 67 in the path of the end 108 of the block 106.

Coincident with the lower end 103 of the coin chute and in position to receive a coin from the plate 78 is another coin chute 109 having a spout 110 leading to a conduit 111 which in turn discharges into a receptacle 112 preferably located at the center of the casing 1 near the bottom of the latter and freely accessible to the customer. This receptacle 112 may be common to all the vending machines in the one casing when more than one machine is lodged in a single casing. The coin chute 109 is provided on its inner face with a plate hinged at its lower edge to the coin chute as indicated at 114 while the upper edge of this plate 113 is normally close to the lower end of the extension 103 and below the lowermost position of the plate 78. Near the upper portion of the chute 109 there is an overhang 115 which when the plate 113 is turned toward the front of the chute 109 about the hinge 114 is in close relation to the upper edge of the plate. At an intermediate point the plate 113 is connected to one end of a link 116, the other end of which is connected to the lower end of the lever 117 suitably supported by a pivot connection to the supporting frame while the upper end of this lever is pivotally connected to the lever 39 so that when the latter is moved the lever 117 will participate in such movement.

The plate 113 when its upper edge is beneath the overhang 115 will divert a coin from the plate 78 onto a guide 118 leading to a receptacle 119 within the casing and accessible to authorized persons only. This receptacle 119 may be located at an intermediate point and the guides 118 from the several vending machines may lead thereinto.

Assuming that there is a suitable supply of the web 11 on the drum 10 and that this web has been passed around the roller 20 and threaded through the space beneath the guide plate 12 until its front end is coincident with the knife 29, then if a coin of proper denomination and condition be introduced into the coin chute 94 it will roll edgewise past the opening 97 without escaping therefrom since the magnet 99 will have no effect on this coin and thence the coin drops through the portion 100 of the conduit and finally reaches the inclined lower portion 101, but being of proper diameter the coin is prevented from escaping through the openings 104 by the spring 105. Ultimately the coin reaches the lateral diversion 102 of the coin chute and finally drops flatwise upon the plate 78. The coin being of proper weight will tilt the lever 72 a sufficient distance to bring the edge 68 of the extension 67 of the block 66 into the path of the edge end 108 of the block 106. Now the customer by grasping the handle 86 moves the arms 85 in a downward direction from the shaft 84 and the arm or arms 83 will participate in this rocking movement. Considering only the particular vending machine into which the proper coin has been introduced the arm 83 will on its continued movement bring the end 108 of the block 106 into engagement with the edge 68 of the block 66 and then a rocking movement will be imparted to the lever 60 as the customer continues the progressive movement of the arms 85. The movement of the lever 60 brings the cam member 62 into engagement with the lower end of the bar or rod 46 thus causing the lever 39 to participate in the movement of the lever 60 and this at once brings the ends of the cross head 45 beneath the inturned ledges or flanges 19. The movement of the lever 39 also causes through the link 56 a downward movement of the lever 30 and the withdrawal of the knife 29 from the path of the web, or strip of tickets or stamps although at this particular time the web is not being moved. The rocking movement of the lever 39 ultimately brings the bevel edge 54 of the lever 53 against one of the cross pins or rivets 32 of the lever 30 and the relative movement of the lever 39 to the lever 30 causes a rocking of the lever 53 in a direction to compress the spring 52 thereby tending to move the bar 46 longitudinally toward the guide strip 12. This movement however is prevented by the flanges or ledges 19 now being underridden by the cross head 45. Ultimately however the cross head 45 reaches the end of the plates 18 and the spring 52 at once becomes active to move the bar 46 longitudinally toward the guide plate 12. The pins 50 carried by the cross head 49 participate in the longitudinal movement of the rod 46 and these pins project through the perforations 43 and through the portions of the web immediately overlying the perforations, the ends of the pins entering the slots 13, the two sets of pins being a ticket length or a stamp length apart.

During the movement of the lever 39 in the manner just described the spring 58 has been extended and as soon as the cross head 45 moves around the ends of the ledges 19 the spring 58 becomes active to return the lever 39 to its first position since the lower end of the rod 46 has been moved upward out of the path of the cam end 62 of the lever 60, the end of the cross head 45 now traveling along the upper edges of the ledges

19. The return movement of the lever 39 causes a feeding action of the web for a distance equal to the length of a ticket, the knife 29 having as before stated been moved out of the path of this strip. However when the lever 30 was moved downwardly by the movement of the lever 39 just described under the action of the lever 60 a latch shoulder 120 on a rock arm 121 mounted on the side member 2 or 3 as the case may be and normally controlled by a spring 122 moved over the bar 33 and so locked the lever 30 from return movement under the action of its spring 35. Beyond the latch shoulder 120 the arm 121 is provided with an extension 123 in the path of one of the bolts or rivets 41 securing the two side members of the lever 39 together, and when the lever 39 has completed its return movement under the action of the spring 58, the arm 122 is moved against the action of its spring so as to release the bolt or bar 33 from the latch shoulder 120 and then the lever 30 may return to normal position under the action of its spring 35 thus causing the knife 29 to traverse the portion of the ticket or stamp then projecting beyond the shear plate 28. It is to be noted that the feeding movement of the lever 39 is entirely outside the volition of the customer.

While the movements described have been taking place the rocking movement of the arm 83 is transmitted through the link 82 to the lever 80 and the free end of the latter sweeps between the side members of the extension 77 and ultimately enters the recess 79 of the plate 78 striking the coin resting on the plate and impelling it therefrom toward the conduit 109. The movement of the lever 39 under the impulse of the lever 60 has caused a movement of the lever 117 in a direction to move the plate 113 with its free end under the overhang 115 so that the coin when expelled from the plate 78 strikes the inner face of the plate 113 and is diverted to the guide 118 and by the latter into the receptacle 119, the discharge end 110 of the chute 109 being shut off from the coin by the plate 113. If the customer for any reason places a magnetic slug in the machine it is at once returned to the customer by the action of the magnet 99. If a small coin of other denomination or of too small a diameter to properly operate the machine it is likewise returned to the customer by the spring 105. If however the coin or slug reaches the plate 78 and be other than the proper weight then the vending side of the machine is not operated because the extension 67 of the block 66 is not in the path of the block 106, but the lever 80 is operated as before and the improper coin is discharged from the plate 78 in the same manner as occurs with a suitable coin. However because of the failure of the vending side of the machine to operate the lever 117 remains quiescent and the plate 113 is in its normal position with the upper edge close to the upper end of the extension 103 of the coin chute. Now a coin discharged from the plate 78 finds its way against the upper face of the plate 113 and is guided thereby into the continuation 110 of the chute 109 and finally into the receptacle 112 within reach of the customer, thus notifying such customer that the coin is not suitable for the operation of the machine so that if the customer shall have introduced unintentionally an improper coin the latter is returned and a suitable coin may then be introduced into the machine and the vending side operated properly. Since the active side of the vending machine is entirely automatic the machine cannot be improperly worked nor so manipulated as to deliver more than is intended. The knife shields any access to the strip of tickets or stamps after an operation of the machine while the frictional engagement of the discharge chute for the tickets or stamps prevents the latter from falling and permits a slight projection of the ticket or stamp so that the customer may readily grasp the same and withdraw it from the machine.

It is advisable that the number of operations of the vending side of the machine should be indicated so that the inspector may ascertain whether or not the number of coins in the receptacle agrees with the number of times the vending side of the machine has been operated. For this purpose there is provided a counter or registering device 124, of any suitable character coupled for actuation to any suitable part of the vending mechanism, as by a link 125 to the short arm 55 of the lever 39, so that each time the lever 39 is actuated the counter 124 will be caused to register such operation.

What is claimed is:—

1. In a vending machine, a coin chute, a coin receiving lever having its coin receiving end at the discharge end of the chute, another lever having its free end movable through the coin receiving end of the coin lever, an actuating means accessible to a customer, and connections between the said actuating means and the second named lever for causing the movement of said second named lever with said actuating means.

2. In a vending machine, a vending means, an actuating means therefor movable at all times to the full extent of its travel, a coin responsive lever having at one end a coin receiving member with a recess longitudinal of said lever, means controlled by said lever for causing the coupling of the actuating means to the vending means, another lever movable longitudinally of the first named lever and into the recess in the coin receiving member, and connections be-

tween the second named lever and the actuating means.

3. In a vending machine, a vending means, an actuating means therefor, coin responsive means for coupling the vending and actuating means on the insertion of a proper coin, coin removing means for the coin responsive means connected to the actuating means and a coin directing means in the path of a coin removed from the coin responsive means and coupled to the vending means.

4. In a vending machine, a vending means, an actuating means therefor, coin responsive means for coupling the vending and actuating means on the insertion of a proper coin, coin removing means for the coin responsive means connected to the actuating means and a coin chute in the path of a coin removed from the coin responsive means, said chute having a pivoted coin directing wall connected to the vending means and movable therewith.

5. In a vending machine, a vending means, an actuating means therefor, coin responsive means for coupling the vending and actuating means on the insertion of a proper coin, and a coin chute leading from the coin responsive means to the exterior of the machine, said coin chute being provided with coin directing means connected to the vending means for directing a coin to the interior of the machine into a suitable receptacle on the operation of the vending means.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

FRANK J. SCHUMANN.

Witnesses:

FRANK B. OCHSENREITER,

C. E. PREINKERT.